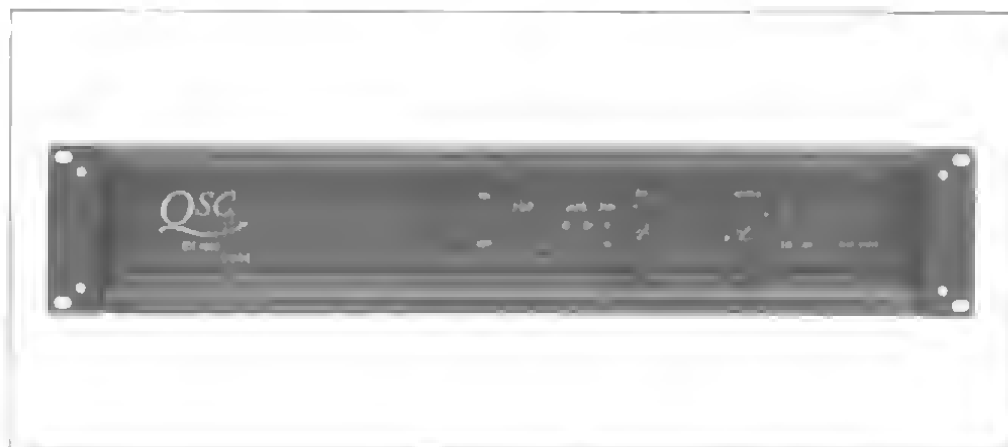


# EX 1600

## F E A T U R E S



The **EX 1600** is an advanced professional power amplifier offering high power, comprehensive operational and protection features, and an extremely flexible interface standard.

The output circuit combines high power with high efficiency to provide greater average and dynamic audio performance, while reducing normal system cooling and AC requirements by greater than 40% over conventional designs. A built-in limiter prevents gross distortion during clipping to further enhance dynamic performance. A sophisticated thermal management system varies fan

speed with heat requirements and, in the event of over-temperature, reduces gain until normal operating temperatures return. Thermal muting occurs only in extreme cases.

The rear panel uses QSC's Open Input Architecture™ which allows the use of second generation signal processing and a wide variety of computer control, optional input connectors, input transformers, cinema crossovers, power limiters, precision attenuators, and other signal processing cards as they become available.

800 watts per channel at 2 ohms

600 watts per channel at 4 ohms

Advanced thermal management system

Built-in clip limiting

Detented gain controls with 2 dB steps for easy resetting

Comprehensive LED status arrays

High efficiency, 2-step output circuit for improved thermal performance and lower AC current consumption

Split secondary configuration— independent power supply on each channel, for greater reliability

Quiet variable speed fan

Independent DC, sub audio speaker protection & thermal overload protection on each channel

Open Input Architecture™—Level 2

Patented Output Averaging™ short-circuit protection

XLR and barrier balanced input connectors

Mono-bridging/parallel switch

Speakon and "Touch proof" binding post output connectors

THX approved for cinema applications

3 year warranty PLUS optional 3 year extended service contract

LOAD	FTC CONTINUOUS AVERAGE	EIA WATTS
	20Hz-20kHz, 0.1% THD	1kHz, 1% THD
Stereo (W/Ch)		
8Ω	400 watts	450 watts
4Ω	600 watts	675 watts
2Ω		800 watts*
Mono-Bridged		
16Ω	800 watts	900 watts
8Ω	1200 watts	1350 watts
4Ω		1600 watts*

\*typical



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# EX Series

## OUTPUT POWER (per channel)

8 ohms, 20 Hz to 20 kHz, 0.1%	THD, 400 watts
8 ohms, 1 kHz, 1%	THD, 450 watts
4 ohms, 20 Hz to 20 kHz, 0.1%	THD, 600 watts
4 ohms, 1 kHz, 1%	THD, 675 watts
2 ohms, 1 kHz, 1%	THD, 800 watts*

## OUTPUT POWER (bridged mono)

8 ohms, 20 Hz to 20 kHz, 0.1%	THD, 1200 watts
4 ohms, 1 kHz, 1%	THD, 1600 watts*

\*typical

## DISTORTION:

SMPTE-IM, less than 0.05%

## FREQUENCY RESPONSE:

20 Hz to 20 kHz,  $\pm 0.1$  dB  
8 Hz to 100 kHz, 10/3 dB

## DAMPING FACTOR:

Greater than 200

## DYNAMIC HEADROOM: 3 dB at 8 ohms

## NOISE: 100 dB below rated output 120 Hz to 20 kHz

## SENSITIVITY: 1.0 Vrms for rated power (8 ohms)

## VOLTAGE GAIN: 55 (35 dB)

## INPUT IMPEDANCE: 10K unbalanced, 20K balanced

## CONTROLS:

Front: AC Switch, Ch 1 and Ch 2 Gain Knobs (with 2 dB detents)  
Back: Parallel/Stereo/Bridge Switch

## INDICATORS:

PWR-ON:	Green LED
LEVEL -30:	Yellow LED
LEVEL -10:	Yellow LED
LIM-CLIP:	Red LED
TEMP-PROT:	Red LED (flashes for over-temp)

## CONNECTORS: (each channel)

Input: Barrier strip and XLR  
Speakers: "Touch proof" binding posts, Neutrik "Speakon" connectors, stereo Neutrik "Speakon".

## COOLING: Continuously variable speed fan, rear-to-front air flow

## AMPLIFIER PROTECTION:

Full short circuit, open circuit, ultrasonic, and RF protection. Stable into reactive or mismatched loads

## LOAD PROTECTION:

On/off muting, clip limiting DC-fault load grounding relay with internal fault fuses.

## OUTPUT CIRCUIT TYPE:

Complementary linear outputs, 2-step high efficiency circuit.

## POWER REQUIREMENTS: 100, 120, 240 Vac, 50-60 Hz

## POWER CONSUMPTION:

Normal Operation, 4 ohms per channel: less than 12 amps, 120 Vac (1440 VA) maximum (full power, 2 ohms per channel), 32 amps, 120 Vac (3900 VA)

## DIMENSIONS:

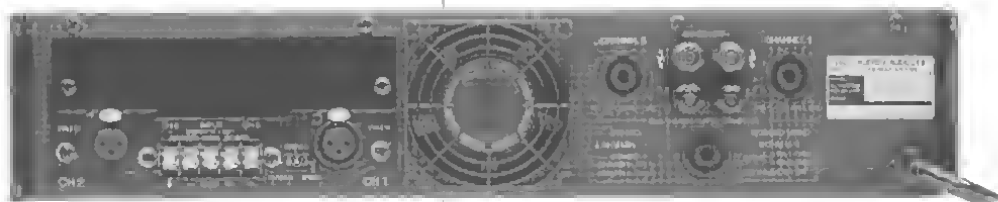
19" (48.3 cm) rack mounting  
3.5" (8.9 cm) tall (2 spaces)  
17.9" (45.5 cm) deep (rear support ears)

## WEIGHT: 44 lbs (20 kg) net; 52 lbs (23.5 kg) shipping

1 Output Averaging™ short circuit protection (US Patent 4,321,554)  
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

## ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The amplifier shall contain all solid-state circuitry, using complementary silicon output devices. The amplifier shall exceed the efficiency of an ordinary class-B linear output circuit. Overall electrical efficiency, with four or eight ohm loads, shall exceed 44% at 1/2 power, and 30% at 1/8 power. The amplifier shall operate from 50-60 Hz AC power, with internal fuses for selecting voltages 100, 120, or 220-240 Vac. The amplifier shall operate from a normal household AC outlet, drawing less than 1440 VA when driven with random program material at 1/8 rated power into four ohm loads. The amplifier shall be supplied with a single molded AC cord having an appropriate AC plug for the intended operating voltage.



The amplifier shall employ internal air cooling with a variable speed fan for minimum acoustic noise.

Air flow shall be from rear to front to avoid temperature rise inside the rack. Rack mounting shall, be possible without clearance necessary between amplifiers for ventilation. The amplifier shall be capable of continuous operation at 1/8 power, into four ohm loads, for ambient temperatures up to 104°F (40°C).

The amplifier shall contain two independent channels on a common printed circuit board, with separate secondary transformer windings, power supplies, and protection systems. All protection systems shall be self-resetting upon removal of fault, and the remaining channel shall continue to operate. Each channel shall have independent protective circuitry against open circuit, short circuit, or mismatched loads. Each channel shall monitor temperature of its heat sink and power transformer, and shall trigger fan speed boost, and if necessary, signal muting to prevent excessive temperature rise. Each channel shall have on-off muting, acting for three seconds after turn-on, and within 1/4 second after turn-off or loss of AC power. Each channel shall have DC-fault protection for the load, consisting of a load-grounding relay with fault fusing to interrupt power. Fault fuses shall be adequately large to prevent nuisance blowing at any output power the amplifier is capable of delivering. Each channel shall have clip-limiting circuitry, using compression triggered by the onset of clipping, to limit clipping to approximately 1% of the average output signal. High frequency overloads above 20 kHz shall result in muting until the excessive signal is removed.

Each channel shall have the following controls and displays: A front panel Gain control, with 11 detents having 2 dB steps for attenuations of 0 to -14 dB, -18 dB, -24 dB, a green LED power-on indicator, two yellow LED output indicators, triggering at -30 dB and -10 dB, a red LED showing true amplifier clipping and activation of the limiting circuit, and a red LED which indicates muting when steadily illuminated, and excessive internal temperatures when flashing.

The output connectors for each channel shall include a "touch proof" binding post and Neutrik "Speakon" connector. A third "Speakon" connector shall be provided for single-cable bridged mono, stereo, and biamp connections.

The input connectors shall be mounted on a removable panel to permit upgrades. The standard input panel shall provide barrier strip and XLR connections for each channel, with pin 2 high. Inputs shall be electronically balanced, with a minimum impedance of 10 k ohms per side, and a common mode rejection of at least 50 dB from 20 Hz to 20 kHz. The standard input panel shall contain switches for mono-bridging and parallel inputs, jumpers for changing the polarity of the XLR connectors, and solder patterns for input isolation transformers, gain reduction resistors, and test-point high and low pass filters.

The input panel shall have enough space behind it to contain a circuit board measuring up to 5.9" wide by 4.3" deep. The multi-pin connector to the amplifier circuitry shall carry regulated DC power of  $\pm 15$  V, unregulated DC power of  $\pm 24$  V, and for each channel, signals for balanced inputs, on-off command, power on/monitor, output signal, temperature, clipping, and muting indicator.

Each channel shall be capable of meeting the following performance criteria with both channels driven. Sine-wave output power of 400 watts into eight ohms, and 600 watts into four ohms, 20 Hz to 20 kHz, with less than 0.1% THD. Frequency response at 3 dB below rated power shall be 20 Hz to 20 kHz within 0.1 dB. The voltage gain shall be 55, equivalent to 35 dB, and the input sensitivity shall be 1.0 Vrms. The signal to noise ratio over the range of 20 Hz to 20 kHz shall exceed 100 dB unweighted. THF damping factor shall exceed 200.

The amplifier chassis shall occupy two rack spaces, with provision for securing the rear corners. Depth from mounting surface to tips of rear supports shall be 17.9" (45.5 cm).

Weight shall not exceed 44 lbs (20 kg). The amplifier shall be the QSC Audio Products Model EX 1500.



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